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Prampolini et al.

(54) ULTRA-RAPID AIR VEHICLE AND RELATED METHOD FOR AERIAL LOCOMOTION

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(56)**References Cited**

U.S. PATENT DOCUMENTS

2.944.764 A 7/1960 Lane et al. 3,076,625 A * 2/1963 Griffith 244/117 A (Continued)

FOREIGN PATENT DOCUMENTS

DE 2136129 A1 2/1973 OTHER PUBLICATIONS

International Search Report for PCT/EP2010/070189; Jun. 4, 2011.

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ABSTRACT (57)

The invention concerns an ultra-rapid air vehicle together with a method of aerial locomotion by means of an ultra-rapid air vehicle, where the air vehicle is propelled by a system of motors formed of turbojets (TB1, TB2), ramjets (ST1, ST2) and a rocket motor which can be made streamlined to reduce the drag of the base during the cruise phase, and where the vehicle has a gothic delta wing (A) fitted with moving fins (a1, a2) at both outer ends of the trailing edge of the delta wing (A).

13 Claims, 9 Drawing Sheets

